Date: Fri, 1 Apr 94 04:30:25 PST
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V94 #82
To: Ham-Homebrew

Ham-Homebrew Digest   Fri, 1 Apr 94   Volume 94 : Issue   82

Today's Topics:

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

Date: Thu, 31 Mar 1994 14:59:17 GMT
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!sol.ctr.columbia.edu!
newsxfer.itd.umich.edu!news1.oakland.edu!rcsuna.gmr.com!kocrsv01!
c22jrb@network.ucsd.edu
Subject: B+ transformers
To: ham-homebrew@ucsd.edu

In article <2na5ma$hke@gazette.esd.sgi.com>, glusk@mechcad3.esd.sgi.com (Mark
Glusker) writes:
> A related question -
>
> If one has a transformer without any labeling,

I am frequantly faced with this problem. After I make my best quess using
methods similar to those that other posters suggested, I hedge my bets a little.
The fist time I apply power to what I think is the primary, I supply it from
a variable auto-transformer and slowly increase the voltage while monitoring
the other windings with a voltmeter (set to the highest range!). In case I
make a mistake despite this caution, I hook a 50 to 100 Watt light bulb in

SERIES with the primary. Not accross it, but in series to limit the current.
An unloaded transformer should not draw enough current to light the bulb.
If it starts glowing brightly, find out what's wrong.

In my opinion, no one who does much home brew should be without a variable
auto-transformer and a light bulb hooked up to jumper clips. They are useful
in many circuits when caution is called for. When I used to do TV service, for
instance, if I got a set in with a shorted horizontal output, and no other
problem apparent after a normal check, I would temporarily replace the fuse
with a 100 W light bulb. It saved the new transistor on several occasions.
12 V bulbs of various sizes are useful for lower voltage circuits. Get the
larger sizes as automotive parts.

--
Jim Buchanan
c22jrb@kopt0017.delcoelect.com
c22jrb@delphi.com
N9SDV (formerly WD9GHJ)

Date: 31 Mar 1994 15:49:55 GMT
From: ihnp4.ucsd.edu!usc!elroy.jpl.nasa.gov!news.larc.nasa.gov!
grissom.larc.nasa.gov!kludge@network.ucsd.edu
Subject: frog people from mars (not the ones from venus
To: ham-homebrew@ucsd.edu

In article <5c.328.15.0N17B348@pplace.com> david.devoursney@pplace.com (David
Devoursney) writes:
>they are coming and they will take us over. flying on their giant
>pancakes they will reak havok on the lives of plumbers by giving
>everybody indigestion. they also will buy all are waffle irons in a
>futile attempt to keep us from getting valuble waffle tecknolagy.

Hey, I have a QSL card from Mars, but what does that have to do with it?
--scott
--
"C'est un Nagra. C'est suisse, et tres, tres precis."

Date: Wed, 30 Mar 1994 04:27:54 GMT
From: tribune.usask.ca!canopus.cc.umanitoba.ca!newsflash.concordia.ca!
CC.UMontreal.CA!IRO.UMontreal.CA!clouso.crim.ca!comback!ydeeps!jbm@decwrl.dec.com
Subject: How to do PSK demodulation?
To: ham-homebrew@ucsd.edu

trier@slc6.ins.cwru.edu (Stephen C. Trier) writes:

>What are the reasonable ways to do binary phase shift keying
>demodulation for amateur radio? A pointer to a reference on it would
>be fine. I've found lots of statements that it can be done, but
>nothing detailed about how to do it.

>   Stephen

>--
>Stephen Trier KB8PWA   "It don't mean a thing if it ain't got that
>Other: trier@ins.cwru.edu   certain je ne sais quois."
>Home: sct@po.cwru.edu   - Peter Schickele

Heh. I can't resist sticking my oar in the murk and thrashing it around a bit. BPSK is fine. QPSK is a bit better in terms of bandwidth efficiency. QAM is even better in terms of bits/Hz, but needs too much SNR. Back to BPSK and QPSK. Is it TDMA (burst mode) or CW modulation? CW is rather boring and easy to do, so I'll tackle TDMA first.

Now, first problem. Is it better to do symbol timing or carrier recovery first? Traditional TDMA systems always did carrier recovery first with a "carrier recovery" preamble. Myself, I'm partial to doing it the other way around just to get rid of the preamble. So, the solution is to first estimate the symbol timing without knowing what the symbols are. This can either be done with Gardner's algorithm at 2 samples/symbol, or with Oerder & Myers' "filter & square" algorithm at 3 samples/symbol. There is yet another algorithm (Mueller & Muller) that works with 1 sample/symbol (but this doesn't work too well for TDMA). So pick an algorithm and estimate the symbol timing.

Next you need to decimate the signal to 1 sample/symbol with the sample centered in the middle of the symbol (Here I'm assuming that the signal is already matched filtered so that intersymbol interference is negligible). Now you can perform non-data-aided (NDA) frequency estimation using either Fitz's algorithm, or Croziers incantation, or even my own NDA multistage estimation algorithm. Pick one. Now that you've estimated the residual carrier offset frequency, remove it.

Next you need to do phase estimation. If you use quadrature differential phase shift keying, the information is encoded in the differential phase shift from 1 symbol to the next. This works really well when you have largish frequency offsets that you can't remove with the above-mentioned frequency estimation algorithms, but you take a 3 dB hit in effective SNR to do it. If you want to stick with coherent detection you can use the Viterbi & Viterbi algorithm (named after Andrew and his daughter Audrey, no joke!). This produces a phase estimate with a 2 way ambiguity for BPSK and a 4 way ambiguity for QPSK. For BPSK you can use differential source coding to get rid of the abiguity or quadrature differential coding for QPSK. If you are

using FEC and a convolutional code, then things get messier, since hard decision differential decoding costs you 2 dB. You can get most of it back with multiple differential decoding, but this is pretty complicated to implement. There are other tricky ways of dealing with Viterbi & Viterbi ambiguity when convolutional encoding, but I'll leave that for a future post.

Confused? I hope so!

John McCluskey

J.McCluskey@ieee.org   <--- I'm so fucking proud of this email alias....
                             it almost makes up for the outrageous yearly
                             dues and the pathetic publication delays.

Date: Thu, 31 Mar 1994 15:43:00 GMT
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!utnut!utcsri!newsflash.concordia.ca!pavo.concordia.ca!md_hill@network.ucsd.edu
Subject: Toner for circuit boards
To: ham-homebrew@ucsd.edu

I have heard that you can get toner for normal photocopiers that is optically black at ultraviolet wavelengths. I want to be abble to photocopy circuit patterns with my home copier for boards where a lower quality result is acceptable (i.e. thick traces etc.).
Message-ID: <31MAR199410435727@pavo.concordia.ca>
Organization: Concordia University
News-Software: VAX/VMS VNEWS 1.41

Does anyone know where one might buy this kind of stuff ?

Any help is greatly appreciated.
-Mark Hillier   Internet: MD_HILL@pavo.concordia.ca
                   Amateur: VE2HVW
                   PACKET: VE2HVW@VE2FKB
" I hear, I forget. I see, I remember. I do, I understand"

Date: 31 Mar 94 13:58:36 GMT

From: ihnp4.ucsd.edu!galaxy.ucr.edu!library.ucla.edu!agate!howland.reston.ans.net!
vixen.cso.uiuc.edu!moe.ksu.ksu.edu!cis.ksu.edu!mac@network.ucsd.edu
To: ham-homebrew@ucsd.edu

References <1994Mar29.133032.4744@arrl.org>,
<1994Mar29.195134.22582@ke4zv.atl.ga.us>, <2na5ma$hke@gazette.esd.sgi.com>c
Subject : B+ transformers (DEFINITIVE ANSWER!)

glusk@mechcad3.esd.sgi.com (Mark Glusker) writes:
....
>If one has a transformer without any labeling,
>what is the best way to figure out how much
>current it can handle at its various voltages?
....

"Rating Unknown Power Transformers", by H.Q. Duguid, published in
Electronics World magazine of July, 1964, pp. 24-25.

Make customary safety tests (determine primary and secondary windings,
apply power to primary and let sit awhile to give transformer time to
overheat, which it [probably] will if something is shorted), etc.

Measure DC resistance of winding and open-circuit output voltage.
Decide if you're going to use choke or capacitor input on filter.
Apply two measurements to graph supplied in the article to determine
probable maximum deliverable current.

I've used this article for years to recycle TV transformers,
and it seems to work fine.

--Myron.
--
Five boxes preserve our freedoms: soap, ballot, jury, witness, and cartridge.
Myron A. Calhoun, PhD EE; Assoc. Professor (913) 539-4448 home
INTERNET: mac@cis.ksu.edu   532-6350 work, 532-7353 fax
UUCP: ...rutgers!depot!mac   Packet radio: W0PBV@N0ARY.#NOCAL.CA.USA.NA

End of Ham-Homebrew Digest V94 #82
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